IN THE CLAIMS

Please amend the claims as follows:

Claims 1-35 (Canceled).

Claim 36 (Currently Amended): A method for measuring frequency characteristics of a direct current acceleration sensor, comprising:

supporting a metal rod with a center longitudinal axis thereof aligned with a direction of gravity acceleration,

impacting one of end surfaces of the metal rod with a projectile to generate and propagate an elastic wave pulse in the metal rod,

using a direct current acceleration sensor provided on the other of the end surfaces of the metal rod to detect an acceleration arising when the elastic wave pulse reflects at the other end surface of the metal rod,

using an optical measuring instrument to measure a velocity of motion of the other end surface of the metal rod arising when the elastic wave pulse reflects at the other end surface of the metal rod, and

obtaining a frequency response of the direct current acceleration sensor from a signal from the direct current acceleration sensor and a signal from the optical measuring instrument.

Claim 37 (Canceled).

Claim 38 (Currently Amended): A method for measuring frequency characteristics of a direct current acceleration sensor, comprising:

supporting a metal rod with a center longitudinal axis thereof inclined at a prescribed angle to a direction of gravity acceleration,

impacting one of end surfaces of the metal rod with a projectile to generate and propagate an elastic wave pulse in the metal rod,

using a direct current acceleration sensor provided on the other of the end surfaces of the metal rod to detect an acceleration arising when the elastic wave pulse reflects at the other end surface of the metal rod,

using an optical measuring instrument to measure a velocity of motion of the other end surface of the metal rod arising when the elastic wave pulse reflects at the other end surface of the metal rod, and

obtaining from a signal from the direct current acceleration sensor and a signal from the optical measuring instrument a frequency response of the direct current acceleration sensor in a state in which the gravity acceleration affects the direct current acceleration sensor and comparing data of said frequency response of the direct current acceleration sensor with data of the frequency response obtained by the method of claim 36, thereby obtaining characteristics with respect to the gravity acceleration in said frequency response of the direct current acceleration sensor.

Claim 39 (Canceled).

Claim 40 (Currently Amended): A method for measuring frequency characteristics of a direct current acceleration sensor, comprising:

supporting a metal rod with a center longitudinal axis thereof aligned with a direction of gravity acceleration,

releasing support of the metal rod to produce a free fall state,

during a period of releasing the support of the metal rod, impacting one of end surfaces of the metal rod with a projectile to generate and propagate an elastic wave pulse in the metal rod,

using a direct current acceleration sensor provided on the other of the end surfaces of the metal rod to detect an acceleration arising when the elastic wave pulse reflects at the other end surface of the metal rod,

using an optical measuring instrument to measure a velocity of motion of the other end surface of the metal rod arising when the elastic wave pulse reflects at the other end surface of the metal rod,

supporting the metal rod immediately after measuring the velocity of motion, and

obtaining a frequency response of the direct current acceleration sensor from a signal from the direct current acceleration sensor and a signal from the optical measuring instrument.

Claims 41-42 (Canceled).

Claim 43 (Previously Presented): A method for measuring frequency characteristics of a direct current acceleration sensor according to any one of claims 36, 38, and 40, in which the one end surface of the metal rod is impacted with the projectile to generate the elastic wave pulse in the metal rod, further comprising:

taking as an input signal to the direct current acceleration sensor provided on the other end surface of the metal rod dynamic displacement, velocity or acceleration in a direction normal to the other end surface produced when the elastic wave pulse generated by the impact of the projectile reflects at the other end surface,

using the direct current acceleration sensor to detect, and the optical measuring instrument to directly measure, the input signal having time as a function,

carrying out signal processing with respect to an output signal from the direct current acceleration sensor and the output signal from the optical measuring instrument, and

using data that has been signal processed as a basis for measuring gain-frequency characteristics, phase-frequency characteristics and peak sensitivity of the direct current acceleration sensor in respect of each of dynamic displacement detection function, velocity detection function and acceleration detection function of the direct current acceleration sensor.

Claims 44-52 (Canceled).

Claim 53 (Previously Presented): A method for measuring frequency characteristics of a direct current acceleration sensor according to claim 43, wherein the projectile that impacts the one end surface of the metal rod is composed of a plurality of round, concentric projectiles launched from a launch apparatus that includes multiple round, concentric launch tubes, in which the launch apparatus can precisely and independently control launch timing of each projectile launched.

Claims 54-55 (Canceled).

Claim 56 (Currently Amended): An apparatus for measuring frequency characteristics of a direct current acceleration sensor, comprising:

a metal rod support apparatus that supports a metal rod with a center <u>longitudinal</u> axis thereof aligned with a direction of gravity acceleration,

a launch apparatus for impacting one of end surfaces of a metal rod with a projectile to generate an elastic wave pulse in the metal rod,

a direct current acceleration sensor provided on the other of the end surfaces of the metal rod to detect an acceleration arising when the elastic wave pulse reflects at the other end surface of the metal rod,

an optical measuring instrument for measuring a velocity of motion of the other end surface of the metal rod arising when the elastic wave pulse reflects at the other end surface of the metal rod, and

a processor for calculating a frequency response of the direct current acceleration sensor from a signal from the direct current acceleration sensor and a signal from the optical measuring instrument.

Claim 57 (Canceled).

Claim 58 (Currently Amended): An apparatus for measuring frequency characteristics of a direct current acceleration sensor, comprising:

a metal rod support apparatus that supports a metal rod with a center <u>longitudinal</u> axis thereof inclined at a prescribed angle to a direction of gravity acceleration,

a launch apparatus for impacting one of end surfaces of the metal rod with a projectile to generate an elastic wave pulse in the metal rod,

a direct current acceleration sensor provided on the other of the end surfaces of the metal rod to detect an acceleration arising when the elastic wave pulse reflects at the other end surface of the metal rod,

an optical measuring instrument for measuring a velocity of motion of the other end surface of the metal rod arising when the elastic wave pulse reflects at the other end surface of the metal rod, and

a processor that obtains a frequency response of the direct current acceleration sensor, with the direct current acceleration sensor affected by the gravity acceleration, from a signal from the direct current acceleration sensor and a signal from the optical measuring instrument ~~and compares data of said frequency response data with data of the frequency response of the direct current acceleration sensor calculated by the processor described in claim 56~~ to calculate characteristics with respect to gravity acceleration in said frequency response.

Claim 59 (Canceled).

Claim 60 (Currently Amended): An apparatus for measuring frequency characteristics of a direct current acceleration sensor, comprising:

a metal rod support apparatus that supports a metal rod with a center <u>longitudinal</u> axis thereof aligned with a direction of gravity acceleration, releases support of the metal rod to produce a free fall state and re-supports it after a prescribed time,

a launch apparatus that during a period of releasing the support of the metal rod impacts one of end surfaces of the metal rod with a projectile to generate an elastic wave pulse in the metal rod,

a direct current acceleration sensor provided on the other of the end surfaces of the metal rod to detect an acceleration arising when the elastic wave pulse reflects at the other end surface of the metal rod during the period of releasing the support of the metal rod,

an optical measuring instrument for measuring a velocity of motion of the other end surface of the metal rod arising when the elastic wave pulse reflects at the other end surface of the metal rod, and

a processor for calculating a frequency response of the direct current acceleration sensor from a signal from the direct current acceleration sensor and a signal from the optical measuring instrument.

Claims 61-62 (Canceled).

Claim 63 (Currently Amended): An apparatus for measuring frequency characteristics of a direct current acceleration sensor according to one of claims 56[[,]] [[58,]] and [[59]] 58, including the launch apparatus for impacting the one end surface of the metal rod with the projectile to generate an elastic wave pulse in the metal rod, wherein the direct current acceleration sensor detects an input signal as a function of time standing for dynamic displacement, velocity or acceleration in a direction normal to the other end surface produced when the elastic wave pulse generated by the impact of the projectile reflects at the other end surface of the metal rod, said input signal constituting an input signal to the direct current acceleration sensor provided on the other end surface, the optical measuring instrument directly detects the input signal, and the processor carries out signal processing with respect to an output signal from the direct current acceleration sensor and an output signal from the optical measuring instrument and uses data that has been signal processed as a basis for measuring gain-frequency characteristics, phase-frequency characteristics and peak sensitivity of the direct current acceleration sensor in respect of each of dynamic displacement detection function, velocity detection function and acceleration detection function of the direct current acceleration sensor.

Claims 64-70 (Canceled)

Claim 71 (Currently Amended): An apparatus for measuring frequency characteristics of a direct current acceleration sensor according to any one of claims ~~55 to 60~~ 56, 58, and 60, wherein the projectile that impacts the one end surface of the metal rod is composed of a plurality of round, concentric projectiles launched from the launch apparatus that includes multiple round, concentric launch tubes, and the launch apparatus can precisely and independently control launch timing of each projectile launched.

Claim 72 (Currently Amended): An apparatus for measuring frequency characteristics of a direct current acceleration sensor according to any one of claims ~~55 to 60~~ 56, 58, and 60, wherein the launch tube in the launch apparatus that launches the projectile has a surface treated to reduce friction with the projectile.

Claim 73 (Currently Amended): An apparatus for measuring frequency characteristics of a direct current acceleration sensor according to any one of claims ~~55 to 60~~ 56, 58, and 60, wherein the apparatus for measuring the frequency characteristics of the direct current acceleration sensor measures frequency characteristics from shock acceleration in a low peak, narrow frequency band domain of the direct current acceleration sensor.

Claim 74 (Previously Presented): An apparatus for measuring frequency characteristics of a direct current acceleration sensor according to any of claims 56, 58, and 60, wherein the optical measuring instrument comprises a laser interferometer.

Claim 75 (Previously Presented): An apparatus for measuring frequency characteristics of a direct current acceleration sensor according to claim 71, wherein the one end surface of the metal rod contacts a metal ball and the launch apparatus that launches a plurality of projectiles in a concentric circle from the multiple launch tubes precisely controls launch timing with respect to said metal ball to generate an elastic wave pulse in the metal rod.

Claim 76 (Currently Amended): An apparatus for measuring frequency characteristics of a direct current acceleration sensor according to any one of claims ~~55 to 60~~ 56, 58, and 60, wherein the projectile has a structure that is a lamination of different materials to control a frequency band of the elastic wave pulse generated in the metal rod by the impact of the projectile.

Claim 77 (Currently Amended): An apparatus for measuring frequency characteristics of a direct current acceleration sensor according to any of claims ~~55 to 60~~ 56, 58, and 60, wherein in accordance with a theoretical propagation of the elastic wave in the metal rod, when obtaining transient signal distortion of an elastic wave pulse from the strain gauge output signal incident on the one end surface, at least a primary term of a series-expanded Skalak's analytic solution is used.

Claim 78 (Currently Amended): An apparatus for measuring frequency characteristics of a direct current acceleration sensor according to any of claims ~~55 to 60~~ 56, 58, or 60, wherein in accordance with a theoretical propagation of the elastic wave in the metal rod, when obtaining transient signal distortion of an elastic wave pulse from the strain

gauge output signal incident on the one end surface, up to a high-order term of a series-expanded Skalak's analytic solution is used.

Claim 79 (Currently Amended): An apparatus for measuring frequency characteristics of a direct current acceleration sensor according to any one of claims ~~55 to 60~~ 56, 58, or 60, wherein the direct current acceleration sensor has a peak sensitivity determined in accordance with an input acceleration waveform and frequency band produced by a plurality of projectiles launched from the launch apparatus with precisely controlled launch timing.